

REMARKS

Applicant has cancelled claims 2-6 without prejudice or disclaimer. Applicant has amended claim 1 to recite, among other things, "each tubular is provided with two axially extending unthreaded portions which are load-bearing and allow the transfer of loads between the tubulars, and in the assembled connector are mutually parallel, wherein the first axially extending portion on each tubular is greater in length than the second axially extending portion on each tubular." The amendments to claim 1 are supported throughout the specification, including original claims 5-6, lines 1-4 on page 8, and Figures 6 and 7. In addition, Applicant has amended claim 7 to make it dependent from claim 1, instead of claim 6. Moreover, Applicant has amended claim 11 to replace the term "second" with "first." Furthermore, Applicant has amended claim 18 to recite "wherein each tubular is provided with two axially extending unthreaded portions in which the first axially extending portion on each tubular is greater in length than the second axially extending portion on each tubular" and "inserting the axially extending unthreaded portions on each tubular into corresponding recesses on the other tubular." The amendments to claim 18 are supported throughout the specification, including lines 20-24 on page 9, lines 1-4 on page 8, and Figures 6 and 7

The amendments to the claims do not introduce new matter. Accordingly, Applicant respectfully requests entry of the amendments.

Claim Rejections under 35 U.S.C. 112

On page 2, the Office Action rejects claims 11-17 under 35 U.S.C. 112, second paragraph. The Examiner suggests amending claim 11 to replace "second" with "first."

Applicant has amended claim 11 in accordance with the Examiner's suggestion to replace the word "second" with "first." Accordingly, Applicant respectfully submits that the amendment obviates the Examiner's rejection.

Claim Rejections 35 U.S.C.102(b)

On pages 2-4, the Official Action rejects claims 1-18 as being anticipated by Smith et al. (1999). Applicant respectfully traverses the rejection.

Referring to claim 1, the Office Action states that Smith et al. (1999) discloses a

connector for connecting a first tubular 14 to a second tubular 12; the connector comprising a first portion 74 on the first tubular and a second portion 48 on the second tubular, wherein the first and second portions each have axially extending portions which in the assembled connector are mutually parallel.

Claim 1 recites “each tubular is provided with two axially extending portions” and “the first axially extending portion on each tubular is greater in length than the second axially extending portion on each tubular.” Smith et al. (1999) does not teach the above cited limitations. Accordingly, Applicant respectfully requests the Examiner to withdraw the rejection.

The Office Action also asserts (in respect of claims 6 and 14) that the difference in length between the box spigot 15/pin socket 14 and the pin spigot 13/box socket 16 pair is disclosed in Smith et al (1999). Applicant submits that Smith et al. (1999) focuses on the importance of the cross-sectional area of a connector rather than differences in the length of its spigot/socket pairs. For instance, on lines 39-40 of column 5, Smith et al. (1999) indicates that a “cross-sectional nose area is material to the torsional strength of the threaded connection.” Moreover, on lines 34-40 of column 6, Smith et al. (1999) indicates that in order “to maintain a comparable torsional strength and prevent fatigue of the tubular ... it is preferable to maintain a comparable cross-sectional counterbore area 46 with that of cross-sectional area between the root of the last pin thread 58 and an inside diameter 60 of the pin 10 radially adjacent thereto”. Furthermore, on lines 16-21 of column 8, it is held that “once torque is transmitted through the threaded connection, the overall torsional strength of the pin 10 and box 12 is uniformly maintained, provided that the combined cross-sectional counterbore area 46 and cross-sectional nose area 28 are at least 70%, and preferably at least 75% of the cross-sectional box area 52”. At no point does Smith et al. (1999) teach using spigot/socket pairs of different length.

In addition, Applicant respectfully directs the Examiner’s attention to lines 10-12 of column 6 of Smith et al. (1999). Smith et al. (1999) indicates that the box 12 includes a counterbore section 44 having axial length of at least 1.5 inches. In contrast, lines 4-7 of page 8 of the present application indicate that the box spigot 15/pin socket 14 pair are at least 3.5 inches in length and the pin spigot 13/box socket 16 pair are at least 1 inch in length. Therefore, the comparison of Smith et al. (1999) to the present application shows that Smith et al. (1999) did not envisage the benefits of using socket/spigot pairs of different lengths in the manner used in

the present invention.

Referring to the present invention, the use of a box spigot 15/pin socket 14 pair of greater length than the pin spigot 13/box socket 16 pair in combination with a thick box section 12 and relatively large make-up torque abutment shoulder, increases the stiffness of the connection between the pin and box sections of the riser connector. The increased strength of the connector ensures that the bending load applied to an underwater connected pipe is transferred across the connector to adjacent pipes and not to the connector itself. Since the connector no longer bears the bending load, the threads 17 and 18 on the pin 11 and box 12 sections of the connector do not need to be designed to transfer radial loads and can instead be manufactured with only a single axial load flank and inherently reduced tolerances. As a result, the present invention provides the substantial advantages of reducing the technical difficulties and thus costs of producing riser connectors by eliminating the need to manufacture connector threads to high tolerances.

Whilst the main benefit of the present invention is the increased strength and stiffness of the connection between the pin and box sections of a riser connector, the differences in the lengths of the spigot/socket pairs of the present invention provide further advantages including:

- (a) Improving the alignment of box and pin portions of the riser connector during assembly
- (b) Protecting the pin metal seal nose during assembly
- (c) Stabilizing the pin metal seal nose during the application of bending loads

These advantages will now be briefly discussed in turn.

- (a) Improving the alignment of box and pin portions of the riser connector during assembly

The increased length of the box spigot 15/pin socket 14 pair facilitates the alignment of thread profiles 17 and 18 and the pin metal seal nose (i.e. the parallel ends of the pin section 11) when inserting a pin section 11 into a box section 12 during the assembly of a riser connector. This alignment feature minimizes the damage incurred by these components during the assembly process.

- (b) Protecting the pin metal seal nose during assembly

The combination of the reduced length pin spigot 13/box socket 16 pair and the extended

length box spigot 15/pin socket 14 pair ensures that the pin metal seal nose does not contact the box section 12 during the assembly of the riser connector, thereby reducing the risk of pin-metal seal nose damage during assembly.

(c) Stabilizing the pin metal seal nose during the application of bending loads

The reduced length of the pin spigot 13/box socket 16 pair compared with the box spigot 15/pin socket 14 pair causes the stiffness of the connection across the pin spigot 13/box socket 16 pair to be reduced when compared with the stiffness of the connection across the box spigot 15/pin socket 14 pair. This difference in the stiffness of the connection across the respective spigot/socket pairs radially energizes the pin metal seal nose against the mating box seal pocket. The reduced stiffness and length of the pin spigot 13/box socket 16 pair in combination with the high bending load transfer features of the stiffer box spigot 15/pin socket 14 pair thus ensures that the pin metal seal nose remains stable on the application of bending loads thereto.

At no point in Smith et al.(1999) are any of these advantages of the use of different length spigot/socket pairs mentioned or even hinted at. Based on this observation, Applicant respectfully submits that the invention claimed in claim 1 is not taught or suggested by Smith et al. (1999), and thus Applicant respectfully requests withdrawal of the Examiner's rejection.

Applicant has cancelled claims 2-6, rendering the rejection with respect to these claims moot.

Claims 7-17 depend from patentable claim 1. For this reason and the additional features they recite, Applicant submits that claims 7-17 are also patentable over Smith et al. (1999).

Claim 18 recites "each tubular is provided with two axially extending unthreaded portions in which the first axially extending portion on each tubular is greater in length than the second axially extending portion on each tubular." In addition, claim 18 recites "inserting the axially extending portions on each tubular into corresponding recesses in the outer tubular." Smith et al. (1999) does not teach the above cited limitations. Accordingly, Applicant respectfully requests the Examiner to reconsider the rejection.hg

CONCLUSION

In view of the above remarks, Applicant respectfully submits that the application is in condition for allowance. Prompt examination and allowance are respectfully requested. Should the Examiner believe that anything further is desired in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,

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Frederick S. Frei, Reg. No. 27,105
DORSEY & WHITNEY LLP
1001 Pennsylvania Avenue, N.W.
Suite 400 South
Washington, D.C. 20004
Tel. (202) 442-3000
Fax (202) 442-3199